Fig.1

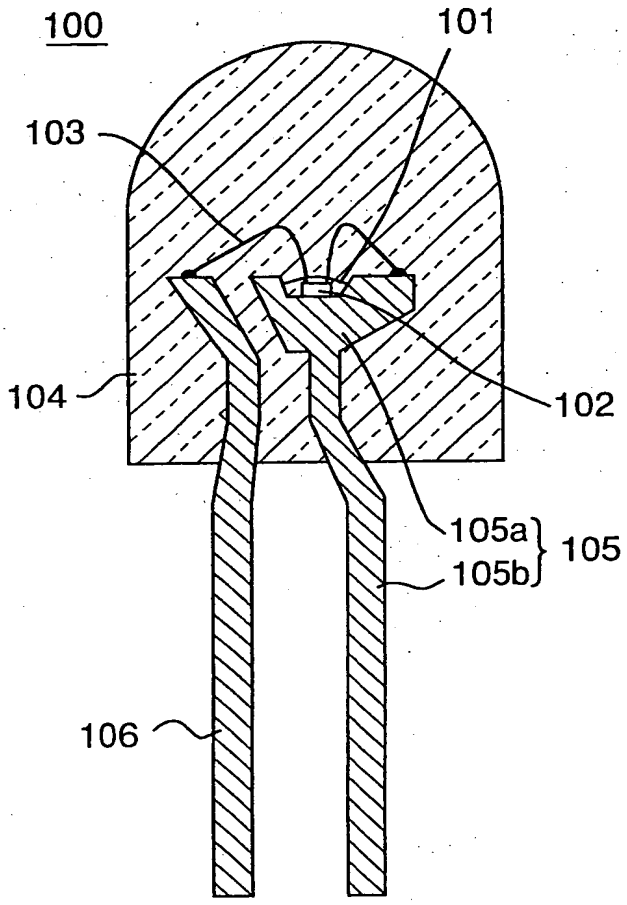


Fig.2

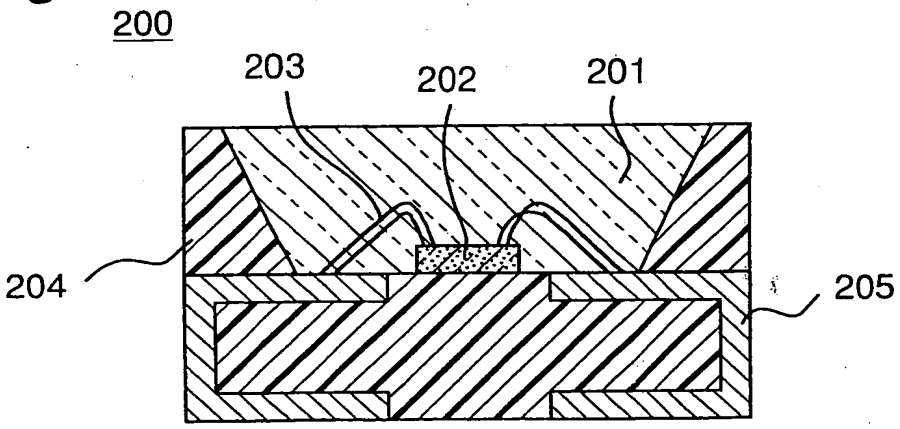


Fig.3A

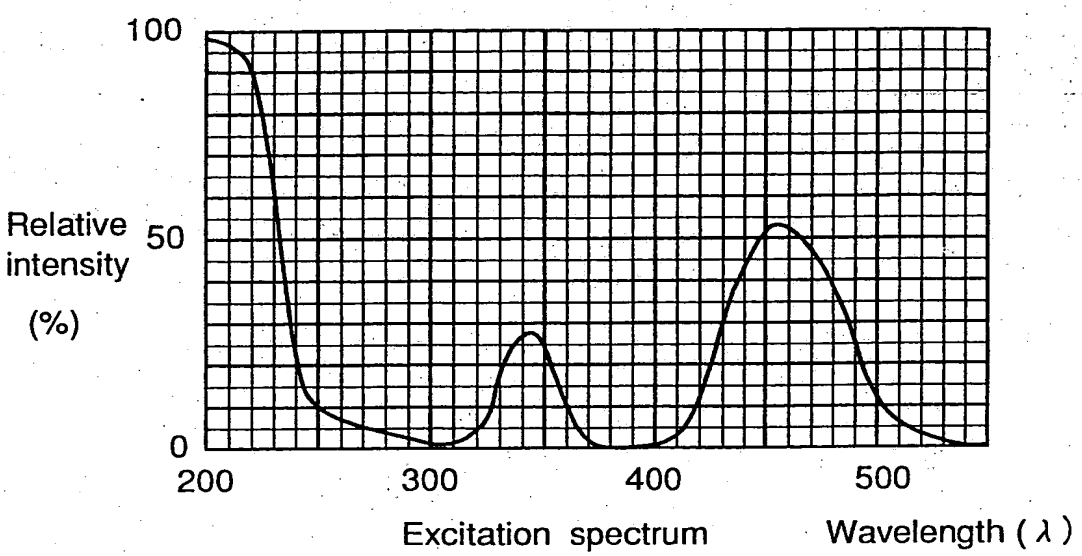

100
50
0
Relative intensity (%)
200
300
400
500
Excitation spectrum
Wavelength (λ)

Fig.3B

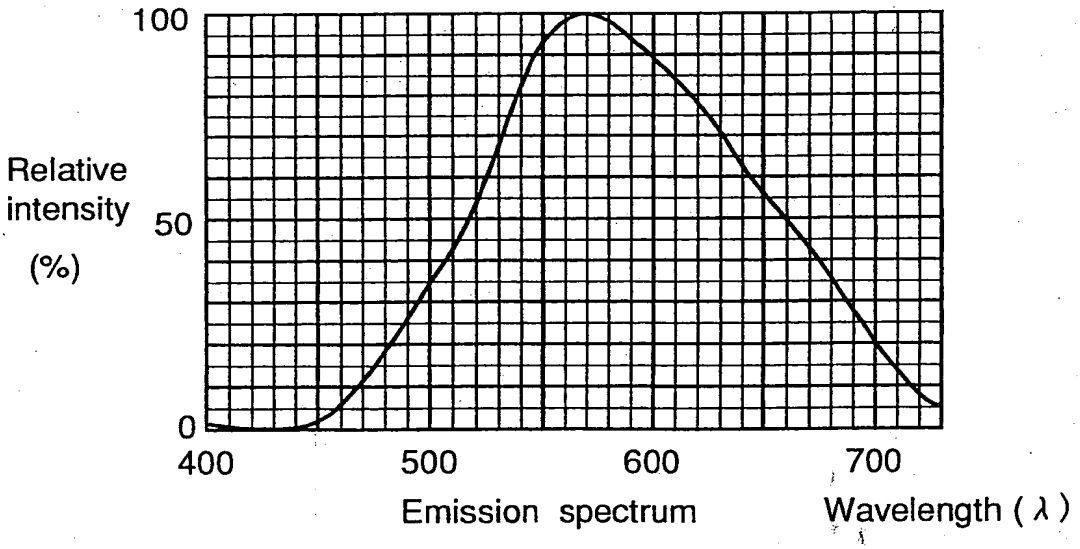

100
50
0
Relative intensity (%)
400
500
600
700
Emission spectrum
Wavelength (λ)

Fig.4

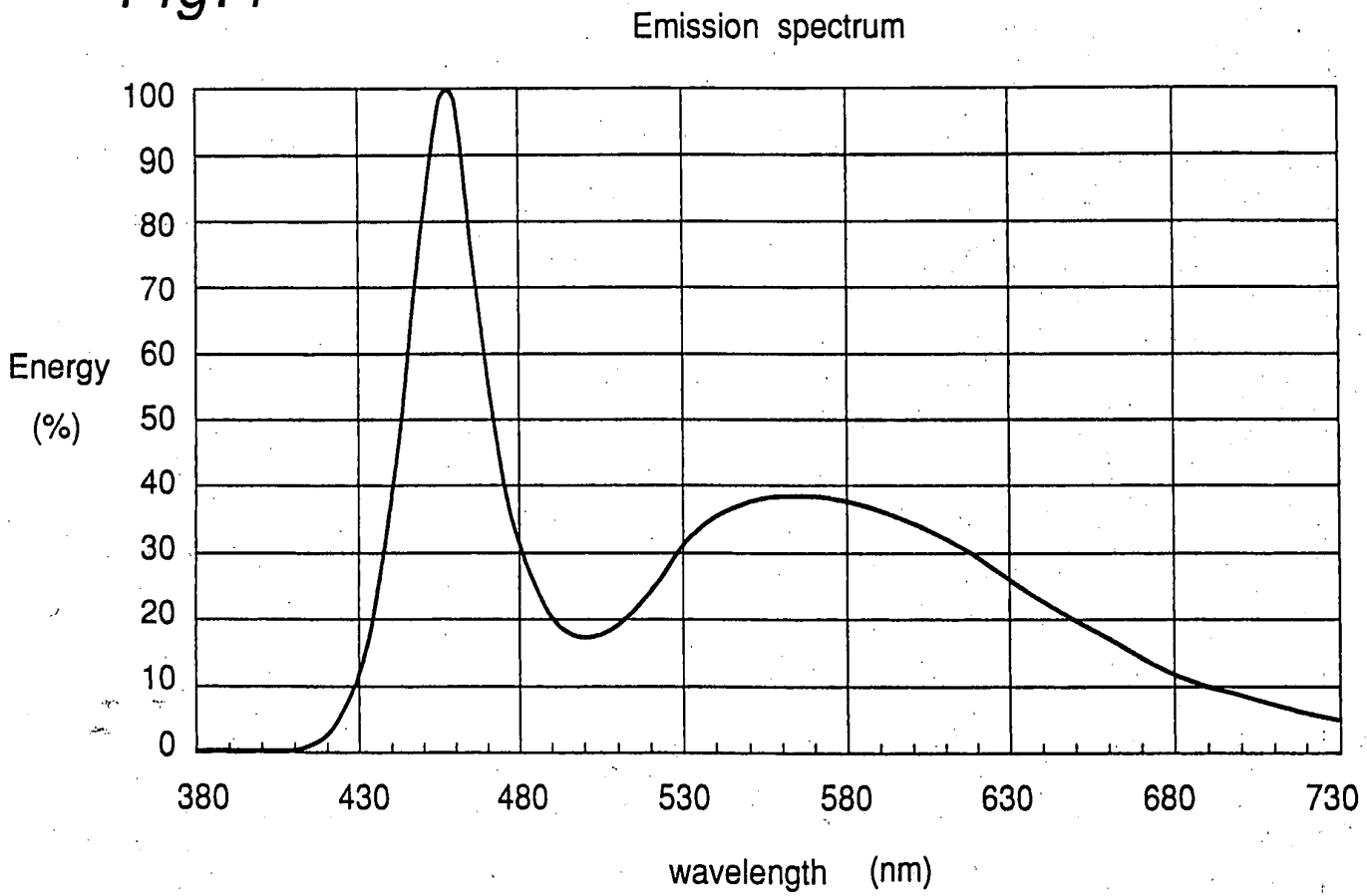

Emission spectrum
Energy
(%)
100
90
80
70
60
50
40
30
20
10
0
380
430
480
530
580
630
680
730
wavelength (nm)

Fig.5A

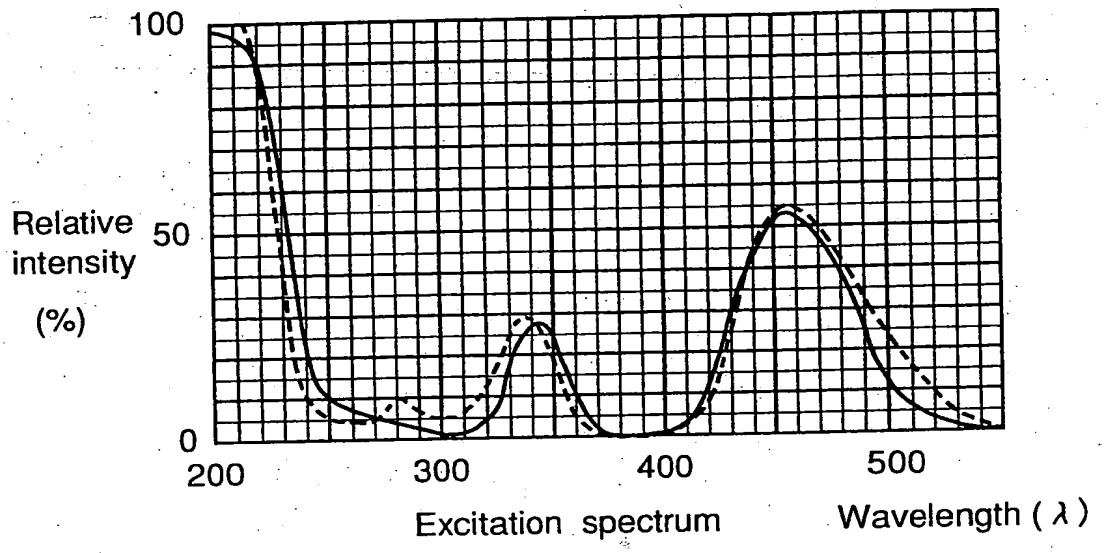

100
50
0
Relative intensity (%)
200
300
400
500
Excitation spectrum
Wavelength (λ)

Fig.5B

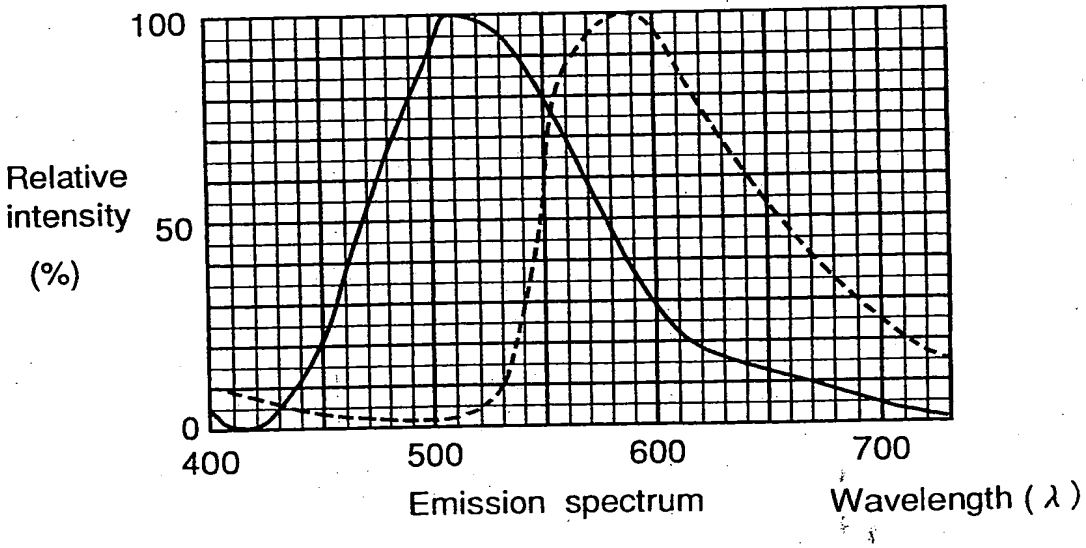

100
50
0
Relative intensity (%)
400
500
600
700
Emission spectrum
Wavelength (λ)

Fig.6

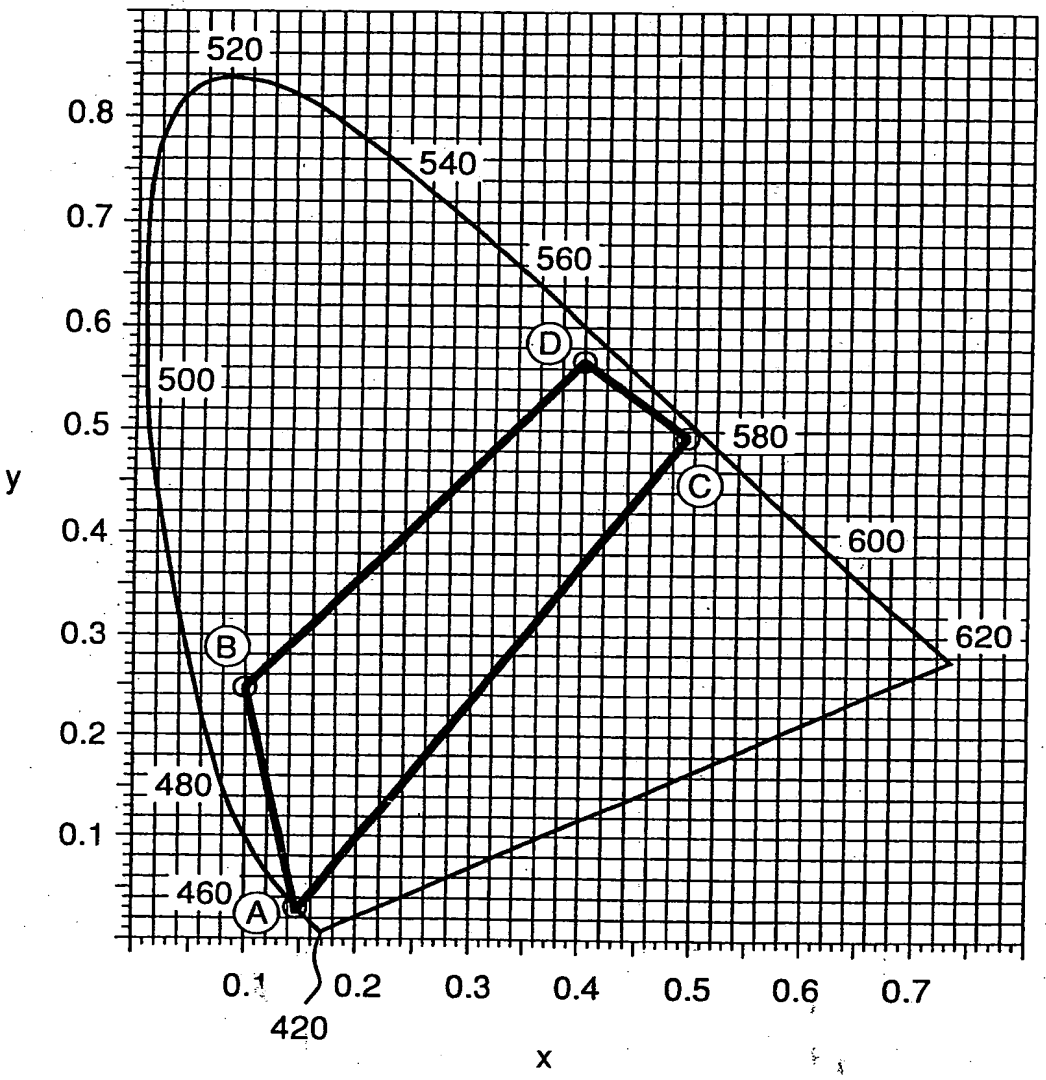

520
540
560
580
600
620
500
480
460
420
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
y
0.1
0.2
0.3
0.4
0.5
0.6
0.7
x
A
B
C
D

Fig.7

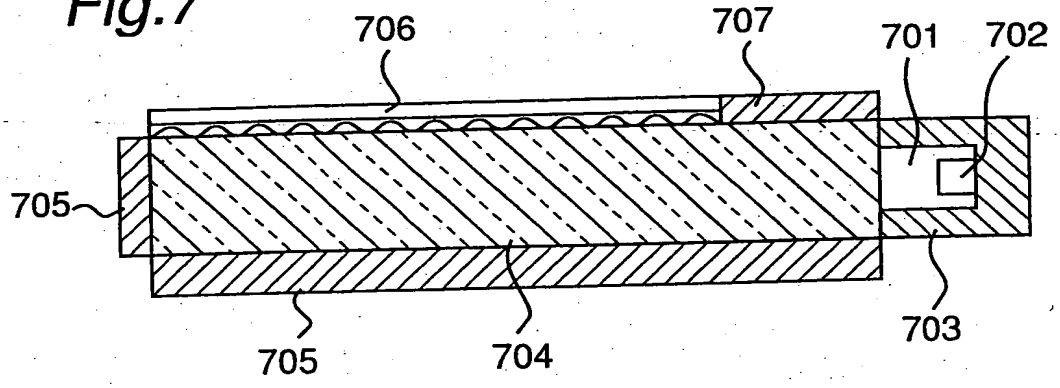


Fig.8

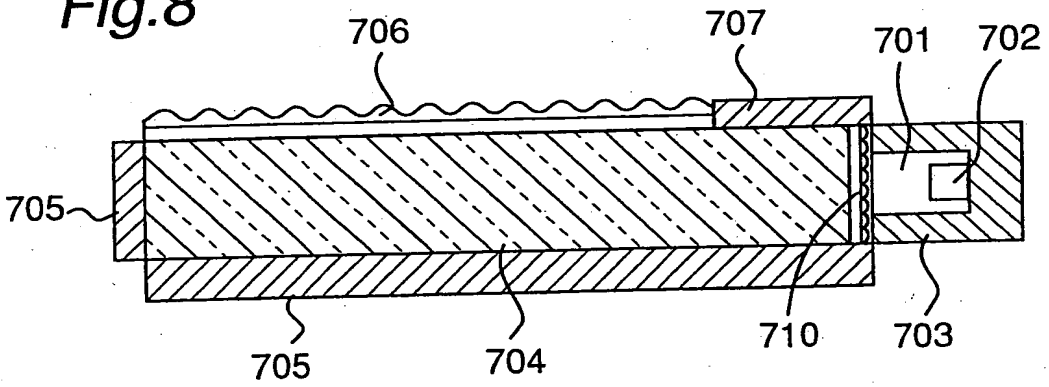


Fig.9

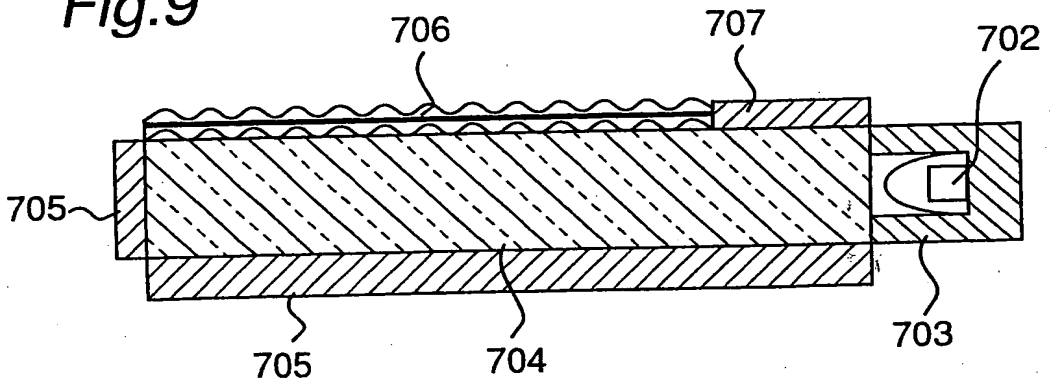


Fig.10

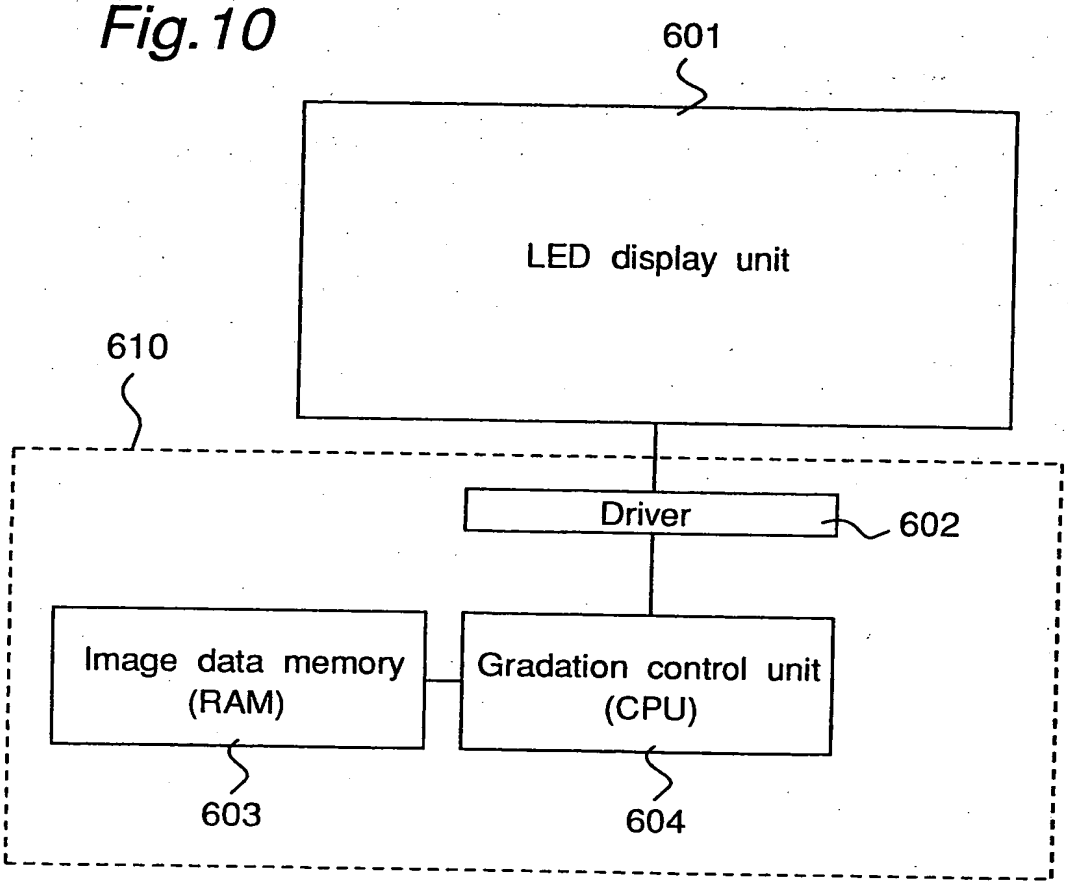

601
LED display unit
610
Driver
602
Image data memory
(RAM)
Gradation control unit
(CPU)
603
604

Fig.11

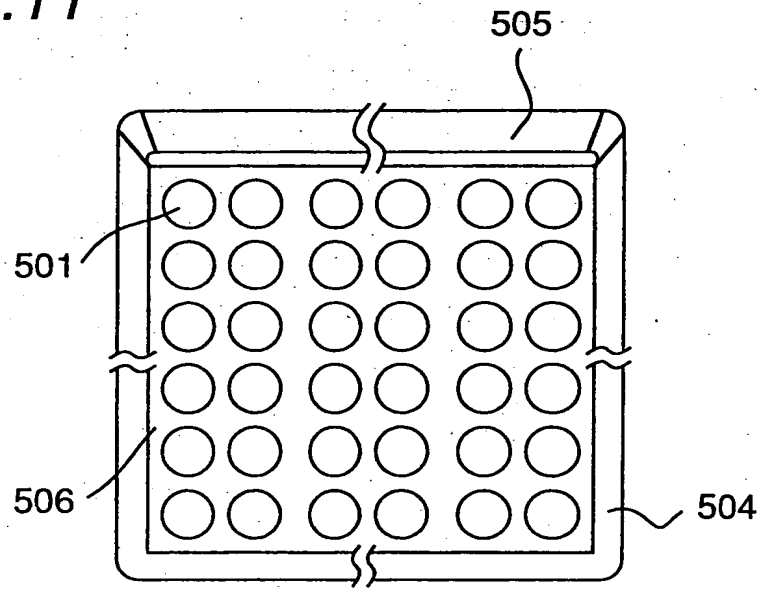


Fig.12

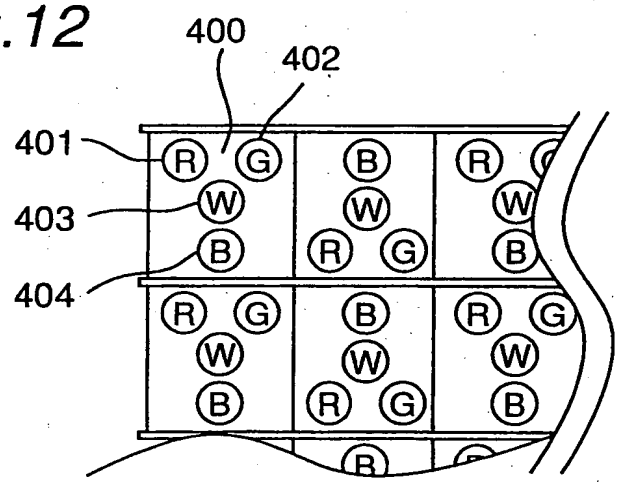


Fig.13A

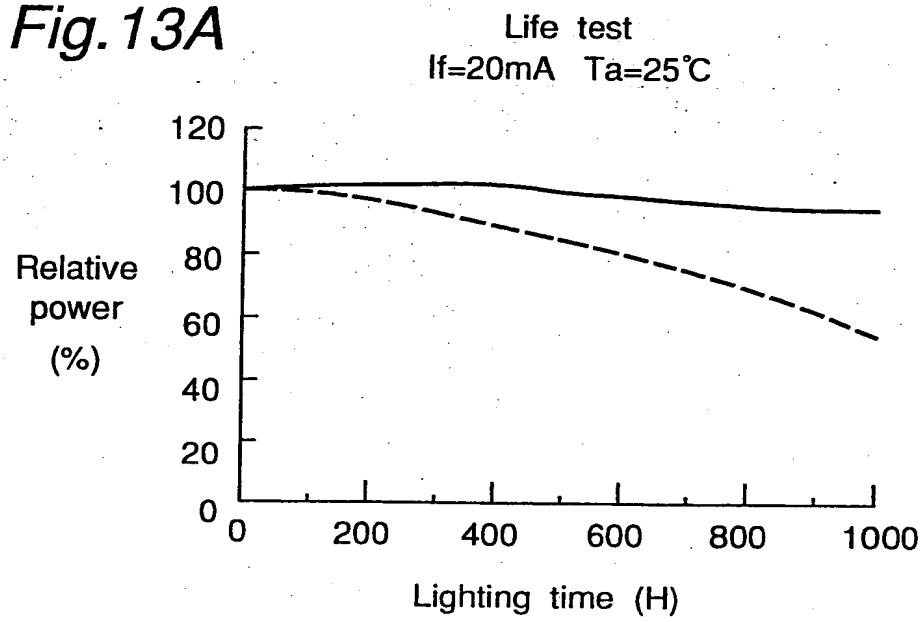


Fig.13B

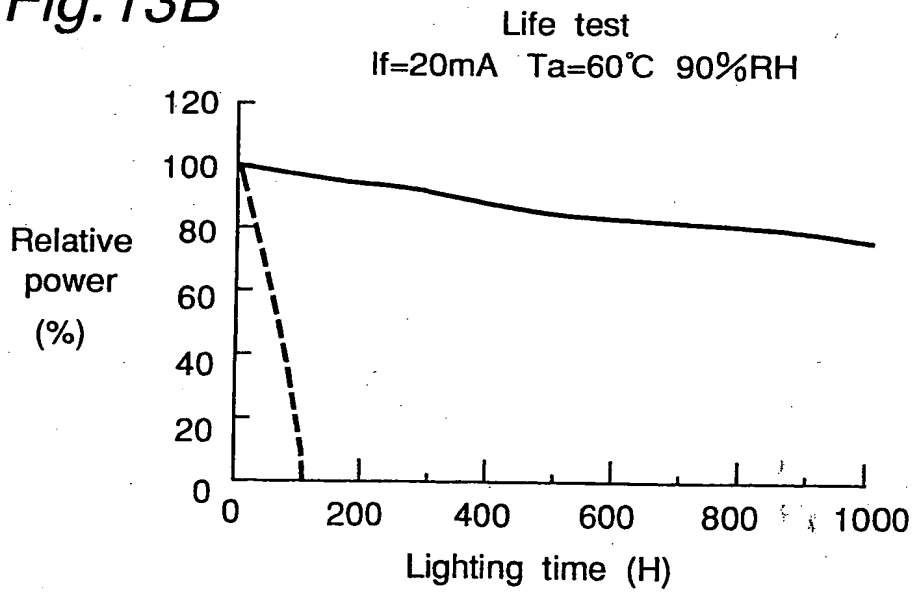


Fig.14A

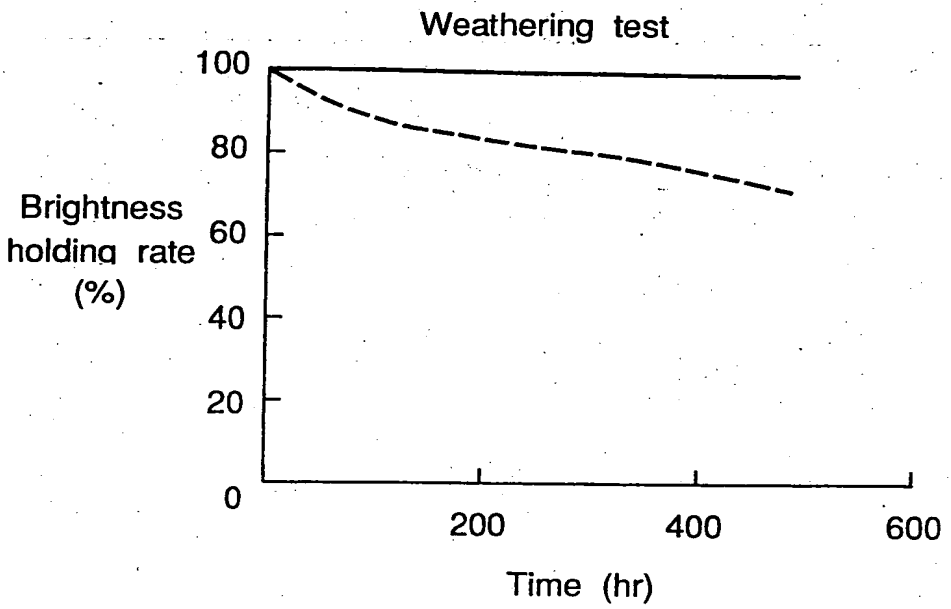


Fig.14B

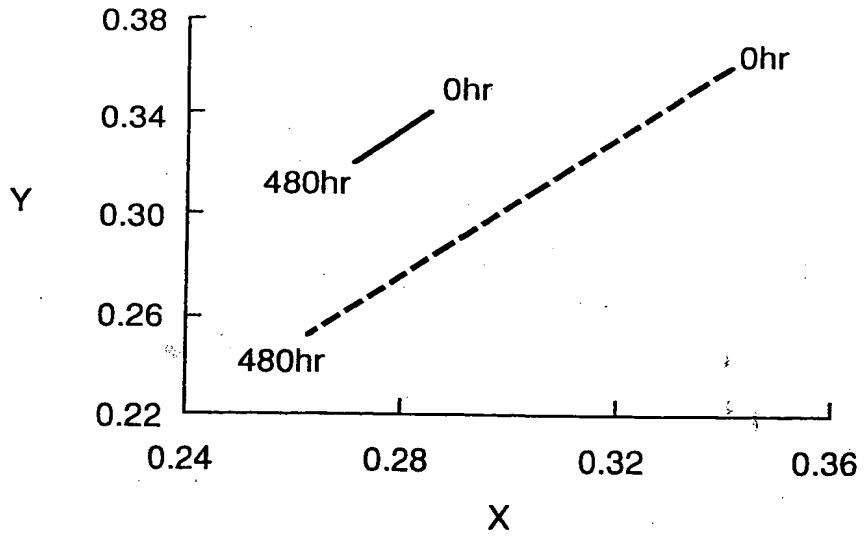


Fig.15A

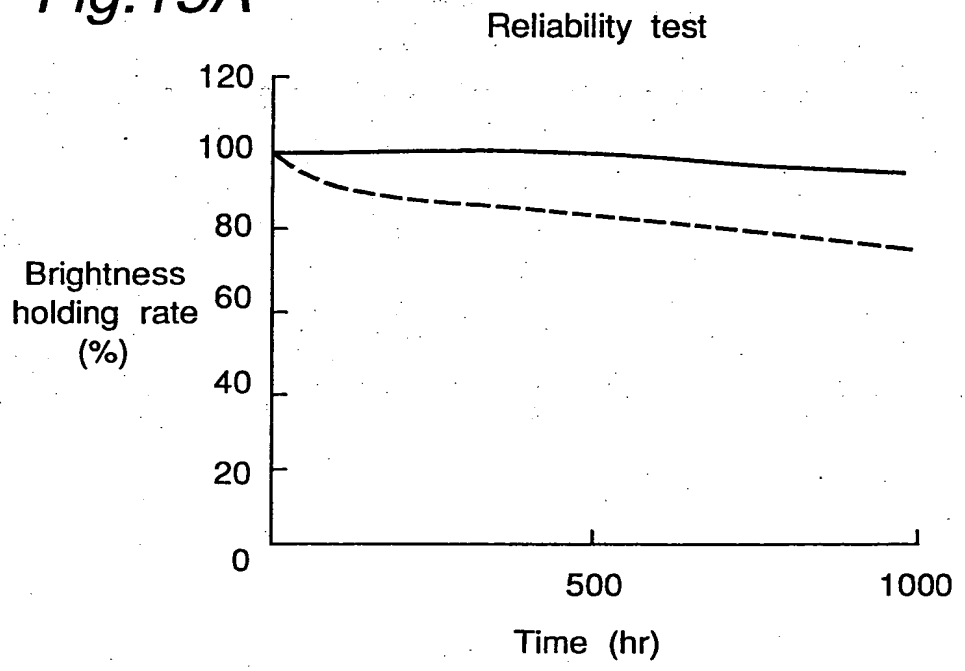


Fig.15B

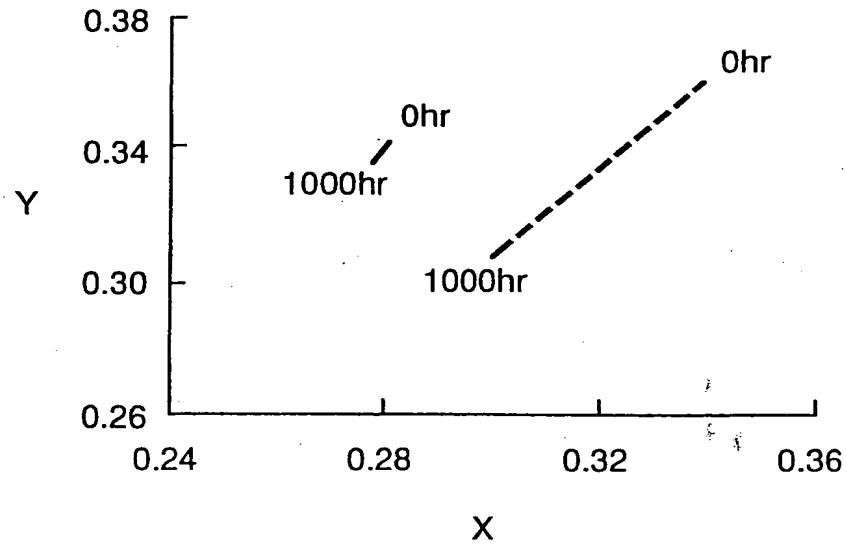


Fig.16

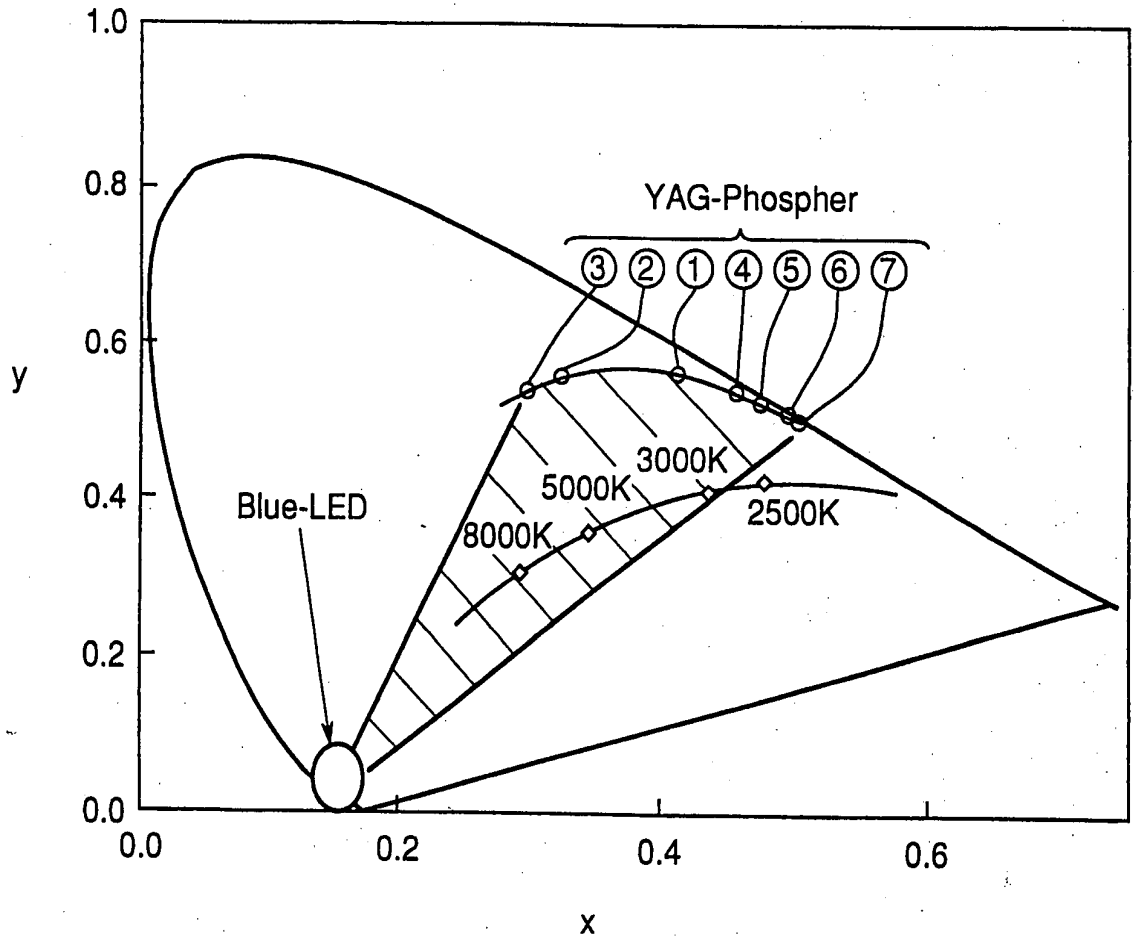

1.0
0.8
0.6
0.4
0.2
0.0
y
0.0
0.2
0.4
0.6
x
YAG-Phospher
3
2
1
4
5
6
7
Blue-LED
8000K
5000K
3000K
2500K

Fig.17

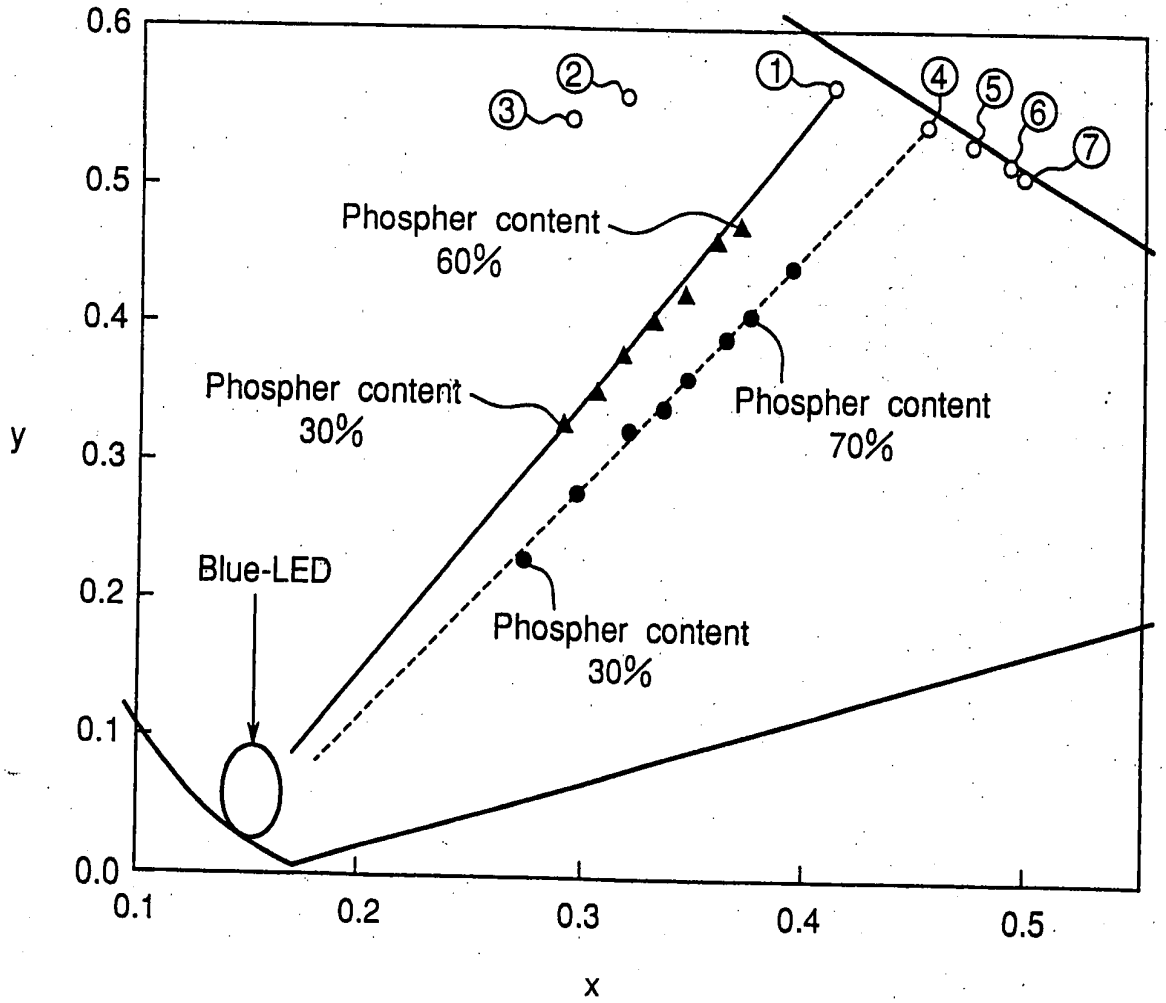

0.6
0.5
0.4
0.3
0.2
0.1
0.0
y
0.1
0.2
0.3
0.4
0.5
x
①
②
③
④
⑤
⑥
⑦
Phospher content
60%
Phospher content
30%
Phospher content
70%
Phospher content
30%
Blue-LED

Fig.18A

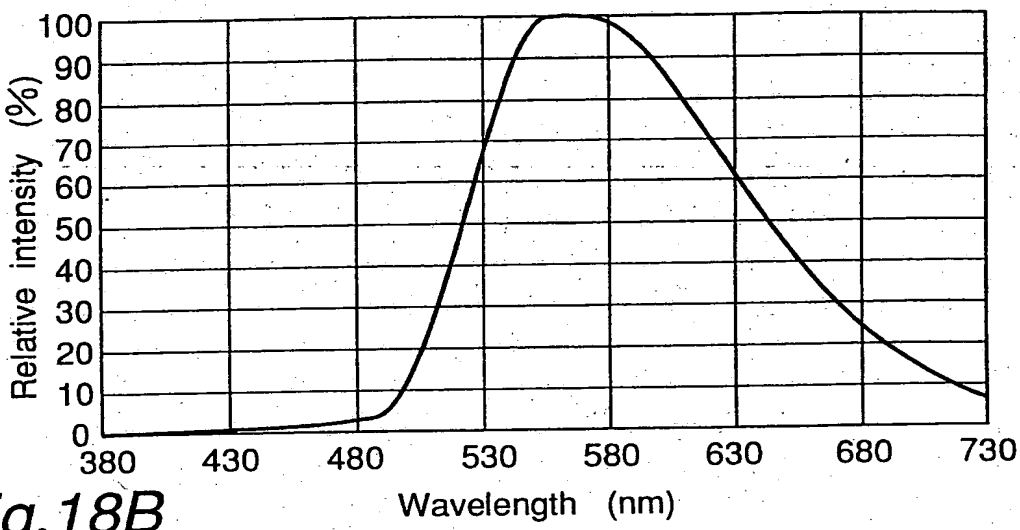


Fig.18B

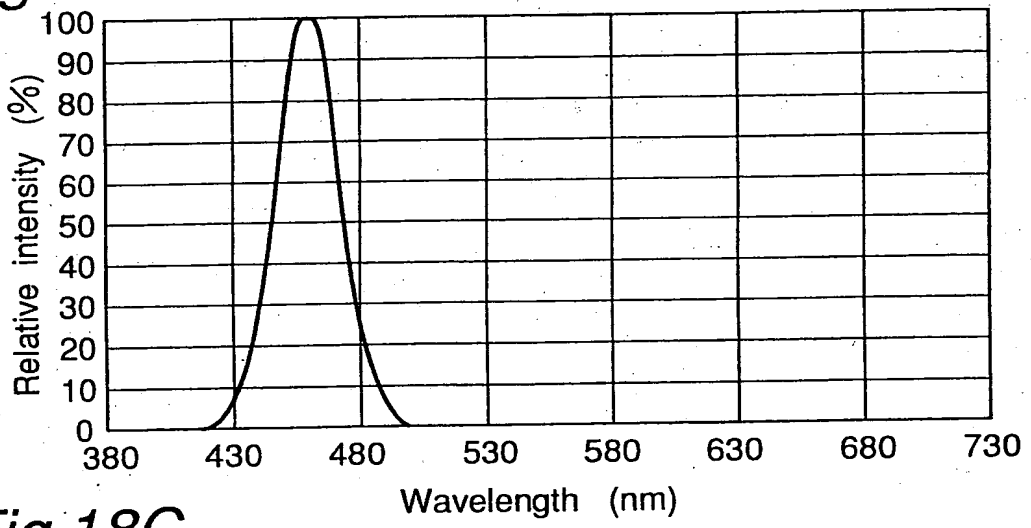


Fig.18C

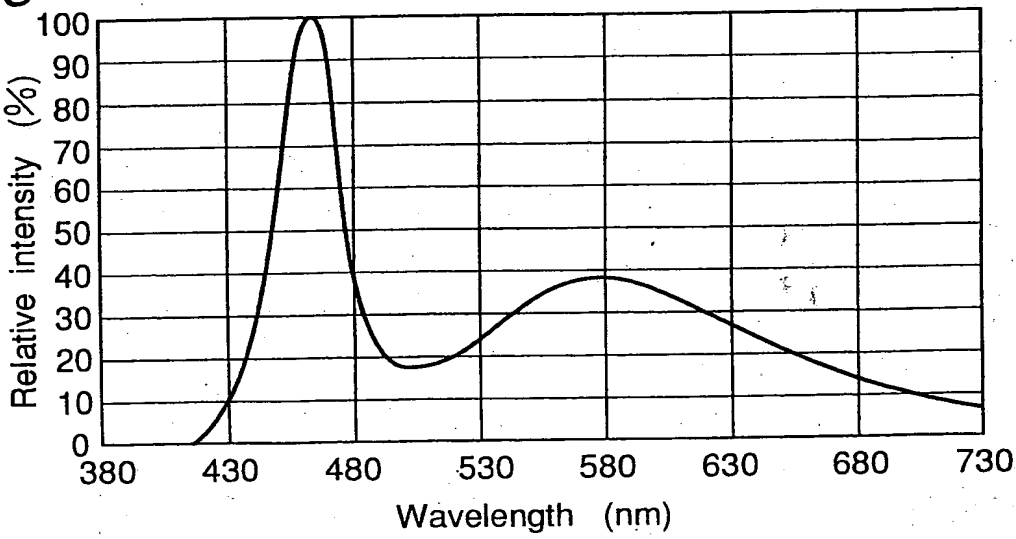


Fig.19A

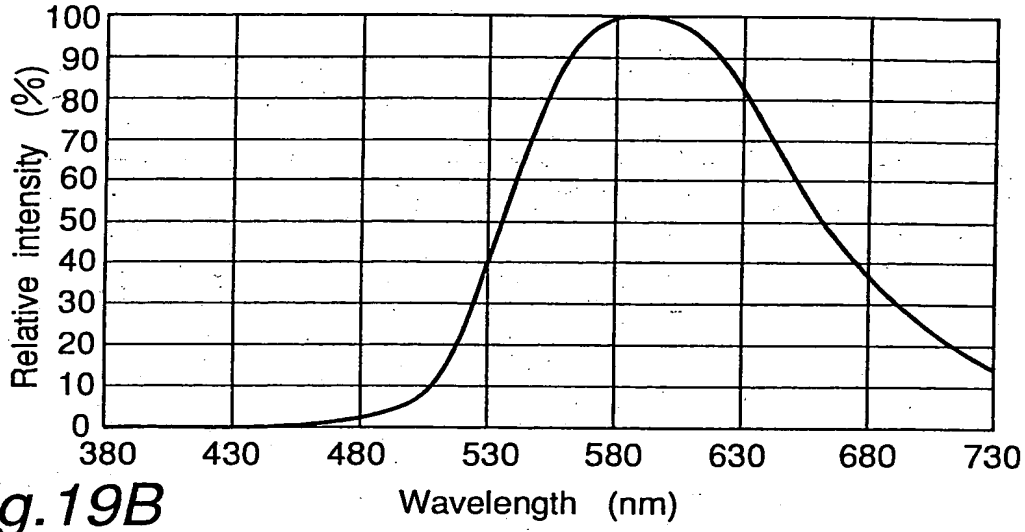


Fig.19B

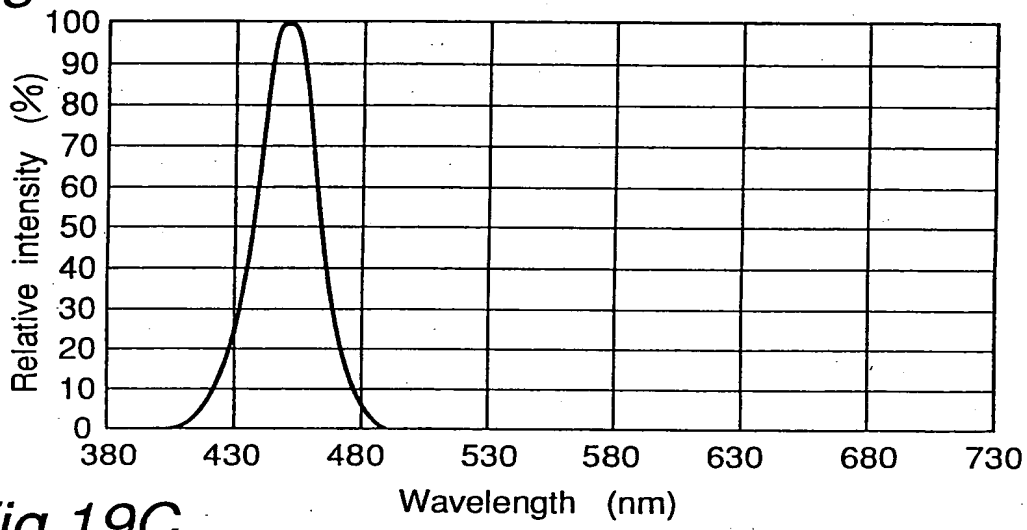


Fig.19C

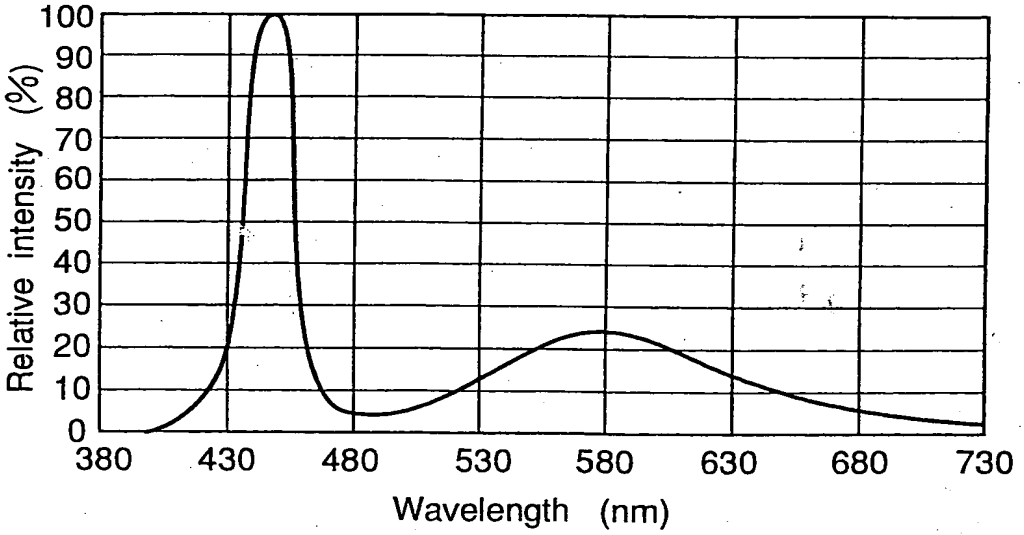


Fig.20A

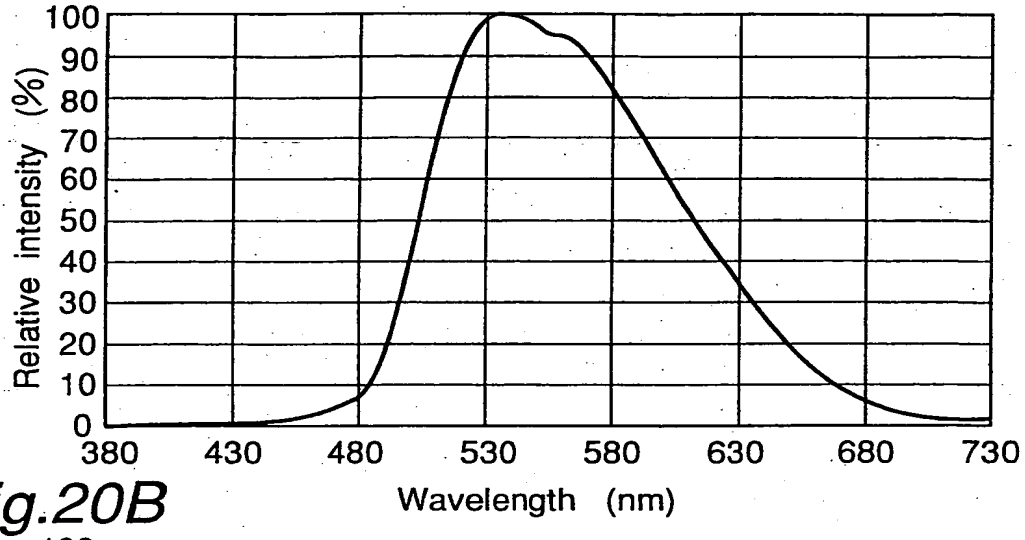


Fig.20B

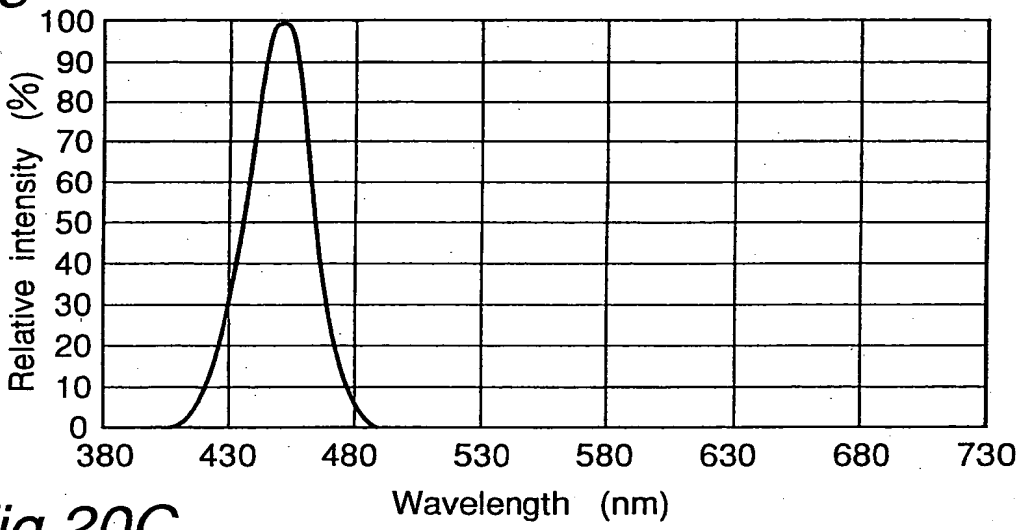


Fig.20C

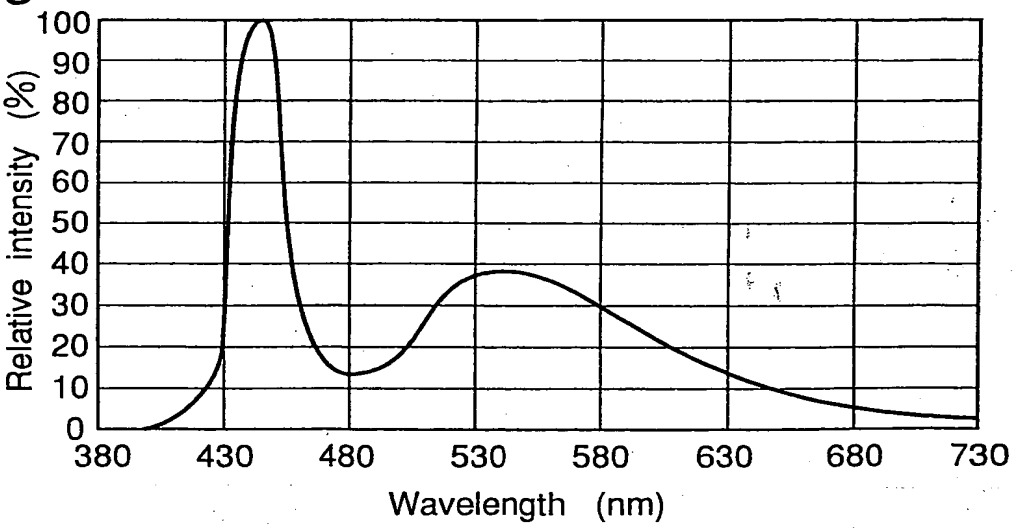


Fig.21A

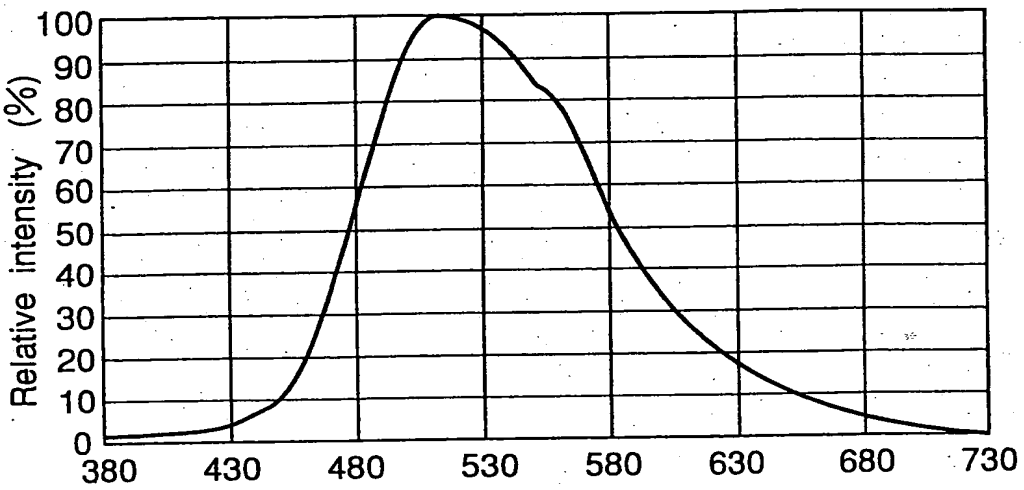


Fig.21B

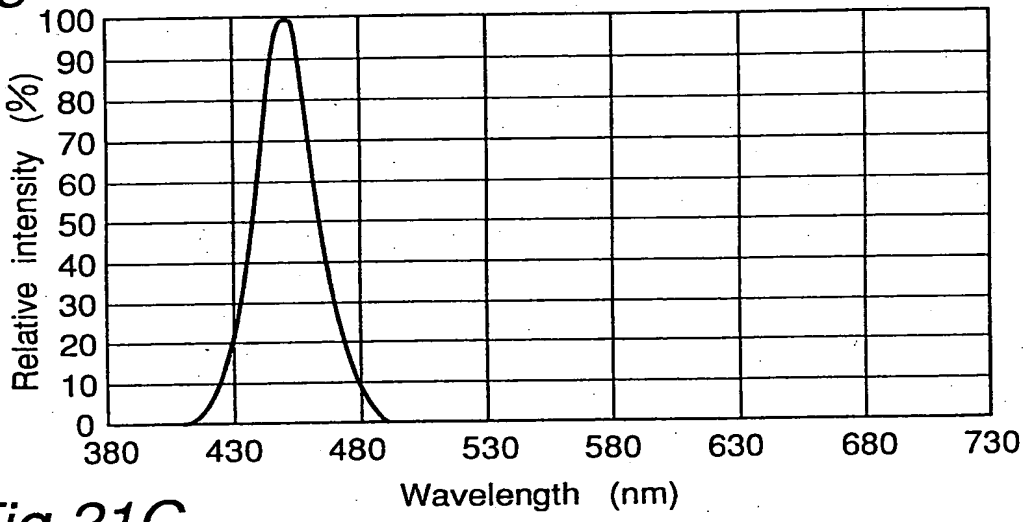


Fig.21C

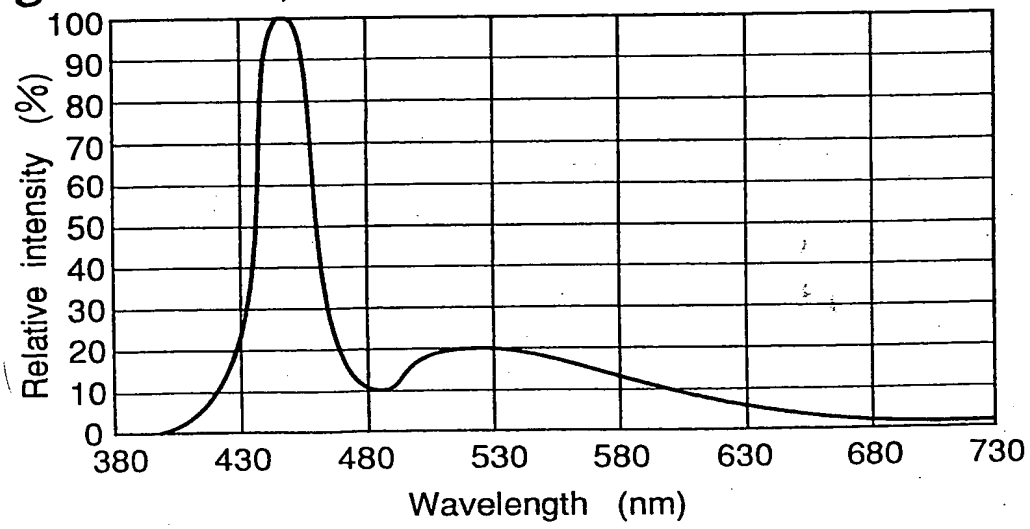


Fig.22A

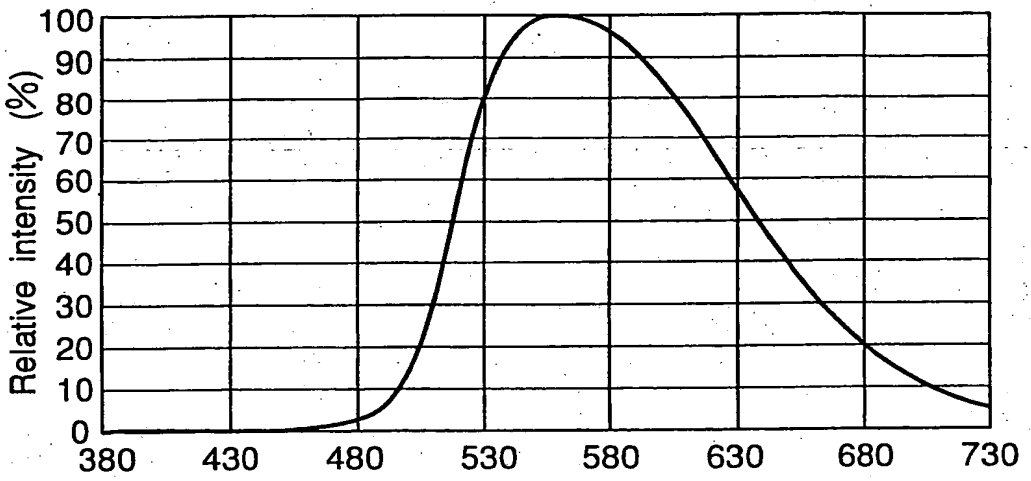


Fig.22B

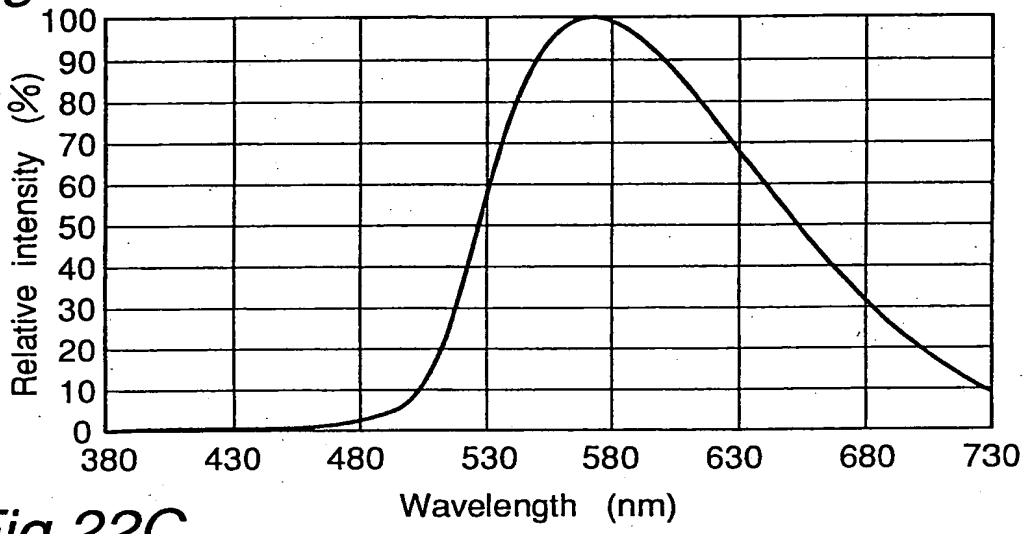
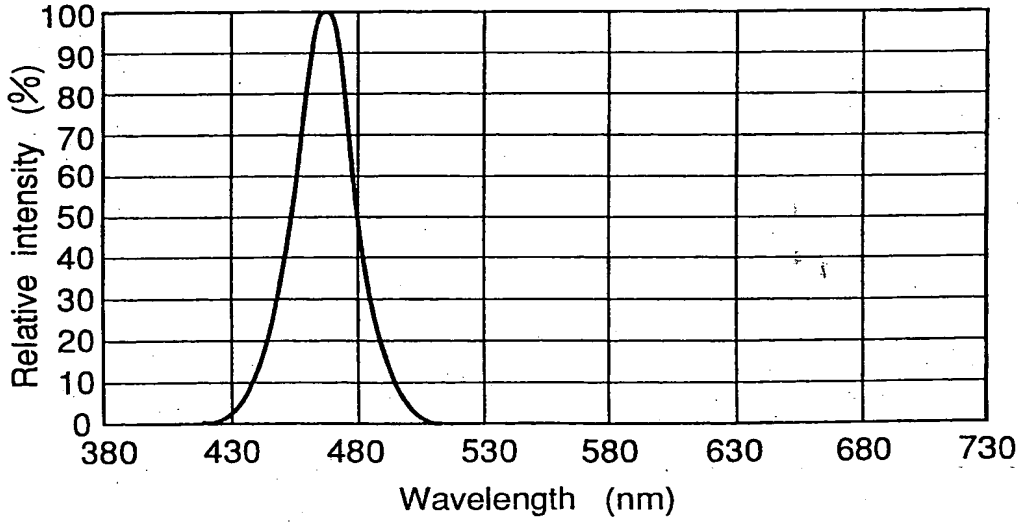


Fig.22C



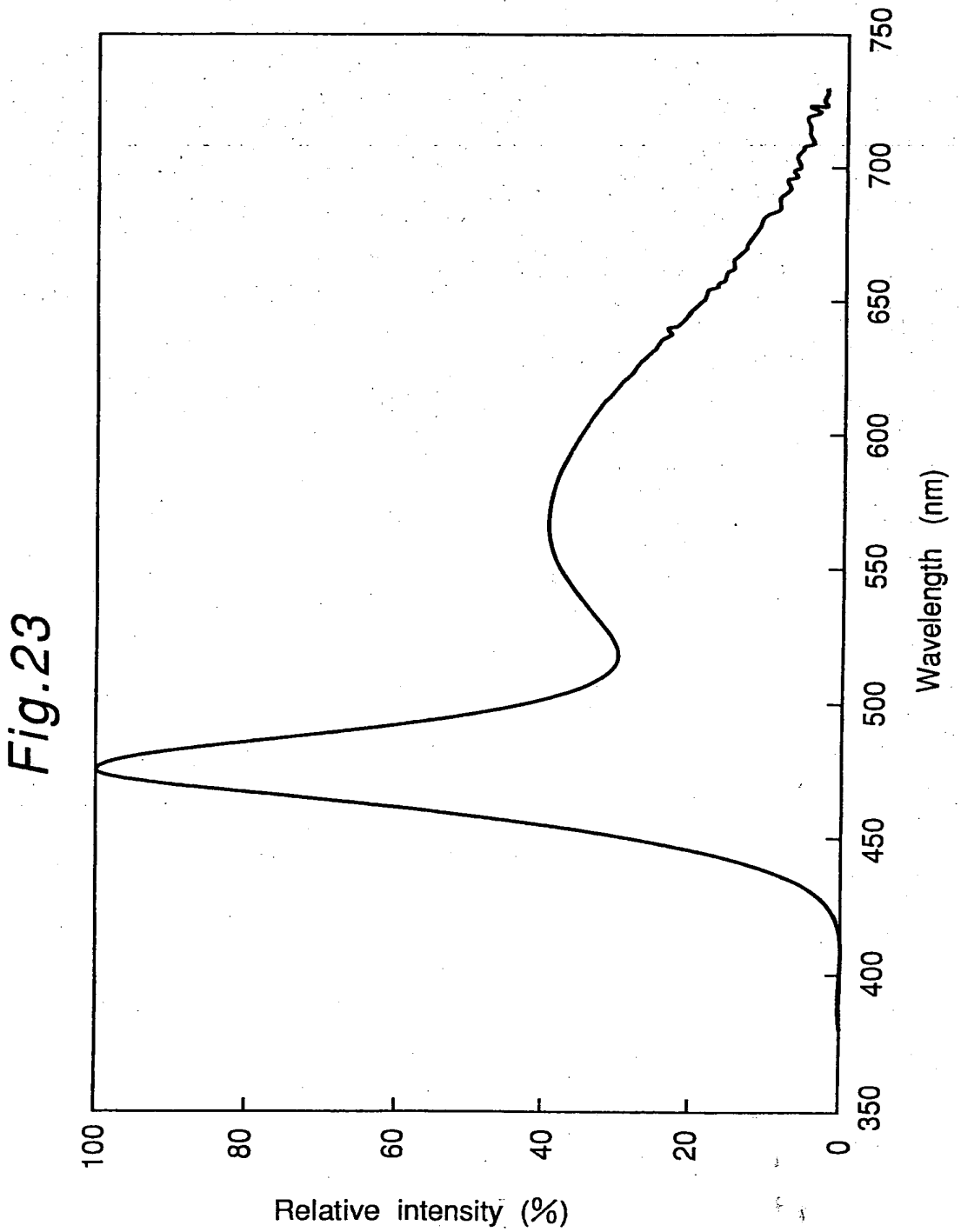

Relative intensity (%)
100
80
60
40
20
0
350
400
450
500
550
600
650
700
750
Wavelength (nm)

Fig.23